MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2016/2017

TCP2201 OBJECT ORIENTED ANALYSIS AND DESIGN

(All sections/groups)

01 JUN 2017
9:00 A.M – 11:00 A.M
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of five (5) pages only including the cover page.
2. There are four (4) questions in this paper.
3. Answer **ALL QUESTIONS**.
4. All questions carry equal marks (10 marks) and the distribution of the marks for each sub-question is given.
5. Write your answers in the answer booklet provided.

Question 1

a) i) Below class TCP2201 doesn't have even a single abstract method, but it has been declared as abstract. Is it correct? Explain your reasons.

[2M]

```
abstract class TCP2201
{
    void methodOne()
    {
        System.out.println("test1");
    }

    void methodTwo()
    {
        System.out.println("test2");
    }
}
```

ii) Below code snippet is showing compilation error.

Can you suggest the corrections?

```
abstract class A
{
    abstract int add(int a, int b);
}

class B extends A
{

}
```

[2M]

b) Create an abstract class "Animal", which defines a method "eat()" and an abstract method "makeNoise()". [5M]

c) Create Dog and Cow subclasses of Animal class. [4M]

d) State the conditions required for overloading a method in Java object classes?

[2M]

...continue

Question 2

a) Typical requirements and specification in software projects activities navigates through how many phases? List all of the phases and explain the 1st phase.

[6M]

b) In your opinion, how can one know that a class given or object is well designed? Give four meaningful metrics and explain the meaning.

[4 m]

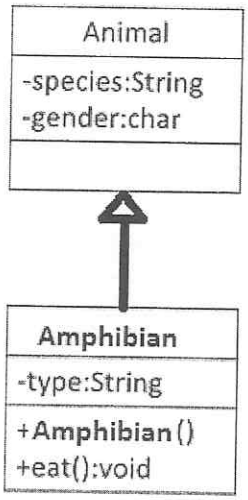
c) By using Java code, illustrate the rules associated with constructors when subclassing a superclass with overloaded constructors. In the code, illustrate both the case of existence of the default constructor and the case of non-existence of the default constructor in the superclass. Explain for both cases. For both cases, can both superclass and subclass be compiled?

[5M]

...continue

Question 3

a) Convert the following UML Class diagram into its equivalent Java code. Include all attributes and methods where necessary. [6M]

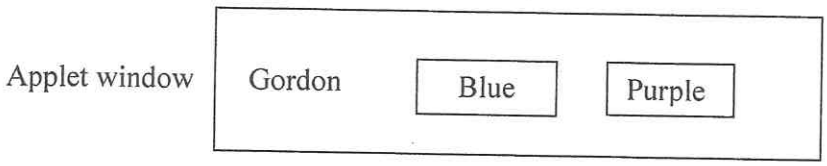


b) Software architecture is a cornerstone of any software engineering project. The architecture describes the subsystems, the interfaces between those subsystems, as well as their dynamic behavior, interactions and shared data. There are many principles in system design. Which are the 4 most important principles? Explain each of the principle briefly.

[4 M]

c) Write a simple Java applet with a label containing the word "Gordon" and two buttons (marked "Blue", "Purple"). See the example below.

[5M]



The buttons have colors Blue and Purple. When a button is clicked, the color of "Gordon" change to the color of the button.

...continue

Question 4

a) Which type of design patterns concern class and object composition? Explain your answer. [3M]

b) Which category do the Bridge and Façade design patterns belongs to? Explain what each pattern does. [6 M]

c) Assuming you and your team are designing a popular song cataloging system. By using the interface, users can search of database for songs of any style. Users do not know the number of songs retrieved but can navigate through the results one-by-one and look at each of the retrieved items' details for further information. The designer in your team has suggested using either the Iterator, Bridge or Builder design pattern as a guide for the library system. Based on the scenario and requirements of the system above, choose the best design pattern amongst the three suggestions. Give your reason of selection. Justify why the other two design patterns are not suitable for this system. [4 M]

d) Which design pattern hides the complexities of the system and provides an interface to the client using which the client can access the system?

[2 M]

End of paper